



Underground Injection Control

in California



Drinking Water Protection Section
US EPA Region 9
April 21, 2015



HOW
DID
THIS
HAPPEN
?



Los Angeles Times
LOCAL / CALIFORNIA

State lawmakers slam oil regulators
after embarrassing lapses

<http://www.sfgate.com/business/article/State-let-oil-companies-taint-drinkable-water-in-6054242.php>

State let oil companies taint drinkable water in Central Valley

By David R. Baker Updated 12:11 pm, Sunday, February 1, 2015

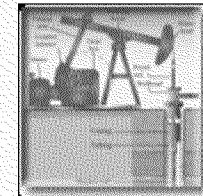
San Francisco Chronicle

EDITORIALS

Regulatory snafu in oil fields may be tainting water supplies

San Francisco Chronicle | March 6, 2015 | Updated: March 6, 2015 2:01pm





- ☐ SDWA & UIC Program
- ☐ USDWs, Aquifers & AEs
- ☐ Well Classes
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SDWA & UIC Program



The Safe Drinking Water Act (**SDWA**) is the main federal law that ensures the quality of Americans' drinking water.

The Underground Injection Control (**UIC**) Program is responsible for regulating the construction, operation, permitting and closure of injection wells that place fluids underground for storage or disposal. There are 6 categories of UIC wells (well Classes I – VI).

SDWA and the UIC Program are designed to protect by preventing endangerment of underground sources of drinking water (**USDWs**).



What is an USDW?

An aquifer or portion of an aquifer that:

- supplies any public water system or contains a sufficient quantity of ground water sufficient to supply a public water system, and
- currently supplies drinking water for human consumption, or
- contains fewer than 10,000 mg/L total dissolved solids (TDS) and is not an exempted aquifer.

What is an aquifer?

An underground geologic formation that is capable of yielding a significant amount of water to a well or spring.

What is an aquifer exemption (AE)?

40 CFR 144.16 allows EPA to exempt certain USDWs from SDWA protection if:

- they contain oil or minerals
- recovery is impracticable
- they are contaminated
- they contain TDS greater than 3,000 mg/L.

All AEs require EPA review and approval. EPA has final responsibility for AE decisions, even if a state has primacy for the UIC program.

Well Classes



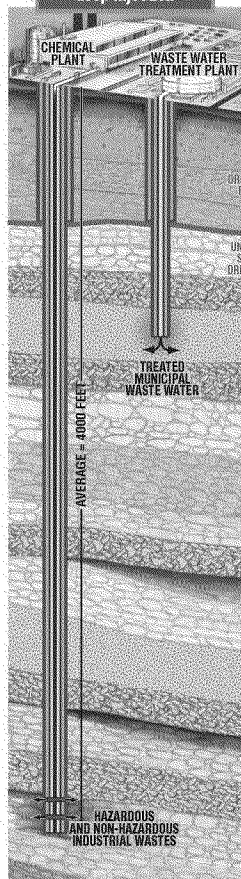
United States
Environmental Protection
Agency

Office of Water
(4006)
Washington, DC 20460

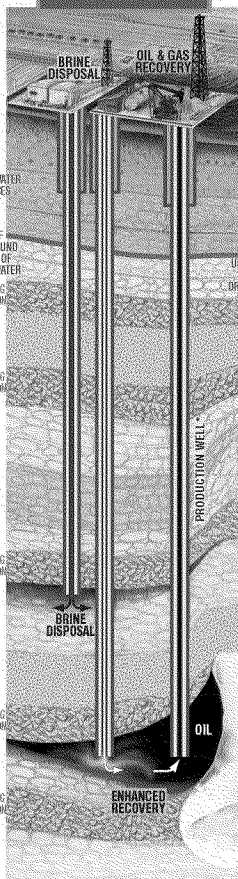
EPA 616-H-10-001
November 2010
<http://water.epa.gov/drink>

Safe Drinking Water Act Underground Injection Control (UIC) Program Protecting Public Health and Drinking Water Resources

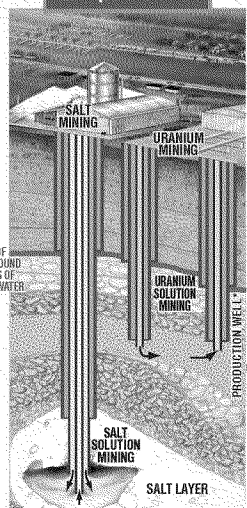
Class I wells-
Isolate hazardous,
industrial and municipal
wastes through deep injection



Class II wells-
Inject oil and gas
production fluids



Class III wells-
Minimize
environmental impacts
from solution mining
operations

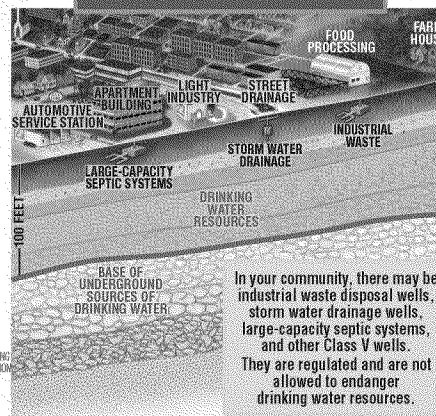


* PRODUCTION WELLS ARE NOT
REGULATED BY THE UIC PROGRAM

Class IV wells-
Banned under all
scenarios except as part of
authorized hazardous
waste cleanup
authorities

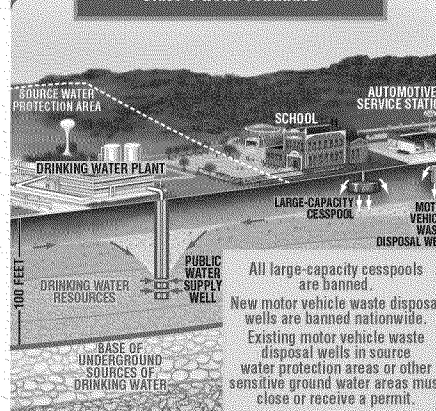


Class V wells-
Manage the shallow injection
of all other fluids to prevent
contamination of drinking water resources



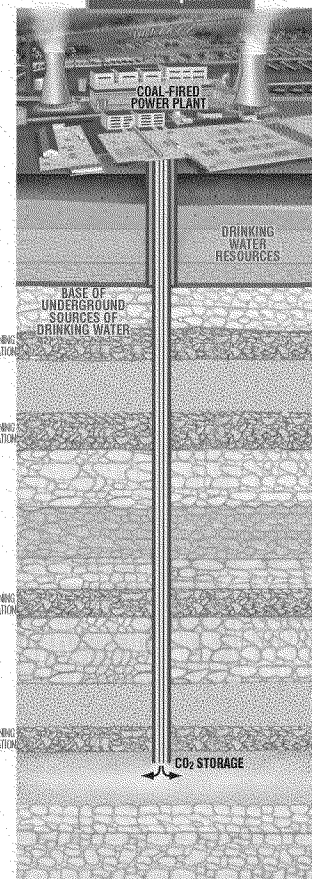
In your community, there may be
industrial waste disposal wells,
storm water drainage wells,
large-capacity septic systems,
and other Class V wells.
They are regulated and are not
allowed to endanger
drinking water resources.

Class V wells continued



All large-capacity cesspools
are banned.
New motor vehicle waste disposal
wells are banned nationwide.
Existing motor vehicle waste
disposal wells in source
water protection areas or other
sensitive ground water areas must
close or receive a permit.

Class VI wells-
Inject CO₂ for
long-term storage to
reduce emissions
to atmosphere



Not drawn to scale



What is a Class II Well?

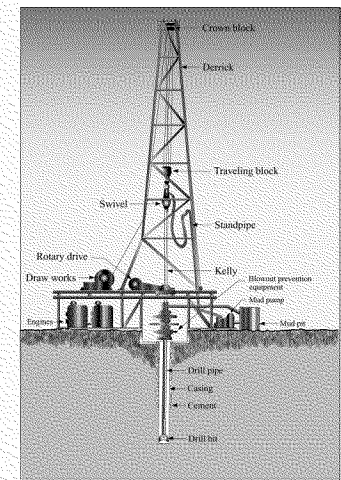
Class II wells inject fluids associated with oil & natural gas production. Most of the injected fluid is salt water (brine), which is brought to the surface in the process of producing (extracting) oil and gas. In addition, brine and other fluids are injected to enhance (improve) oil and gas production.

What are the types of Class II wells?

- enhanced recovery wells
- disposal wells
- hydrocarbon storage wells.

How do Class II wells protect drinking water resources?

By injecting the brine deep underground, Class II wells prevent surface contamination of soil and water.





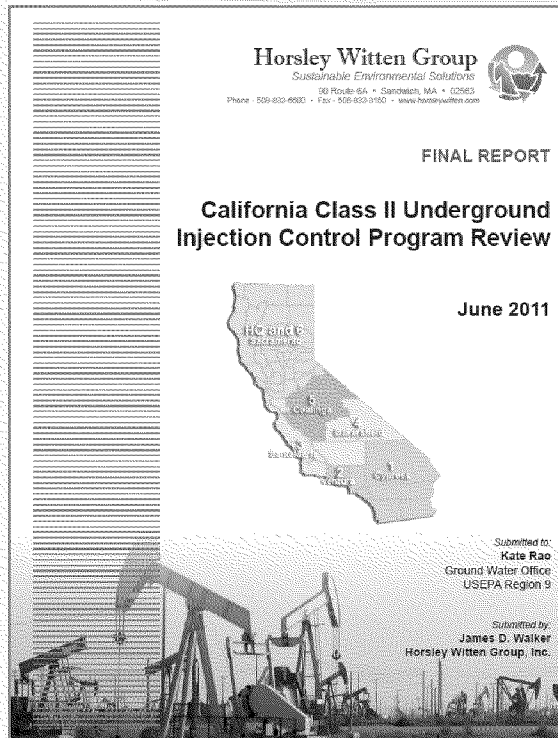
March 1983: The California Division of Oil, Gas and Geothermal Resources (DOGGR) was granted primacy to implement the Class II UIC program.

Petroleum Industry's Contribution to California's Economy

Sales -	\$143 billion (direct, indirect and induced)
Employment -	364,032 jobs (direct and indirect)
Wages -	\$22 billion (direct, indirect and induced)
Taxes -	\$5 billion

Source: LECG, based on 2004 data

There are a total of 50,000 Class II injection wells in California.



2011: EPA conducted an audit of the State Class II UIC Program, identifying deficiencies such as how the State defines protectable USDWs and their methods for identifying an appropriate Area of Review when permitting new wells.

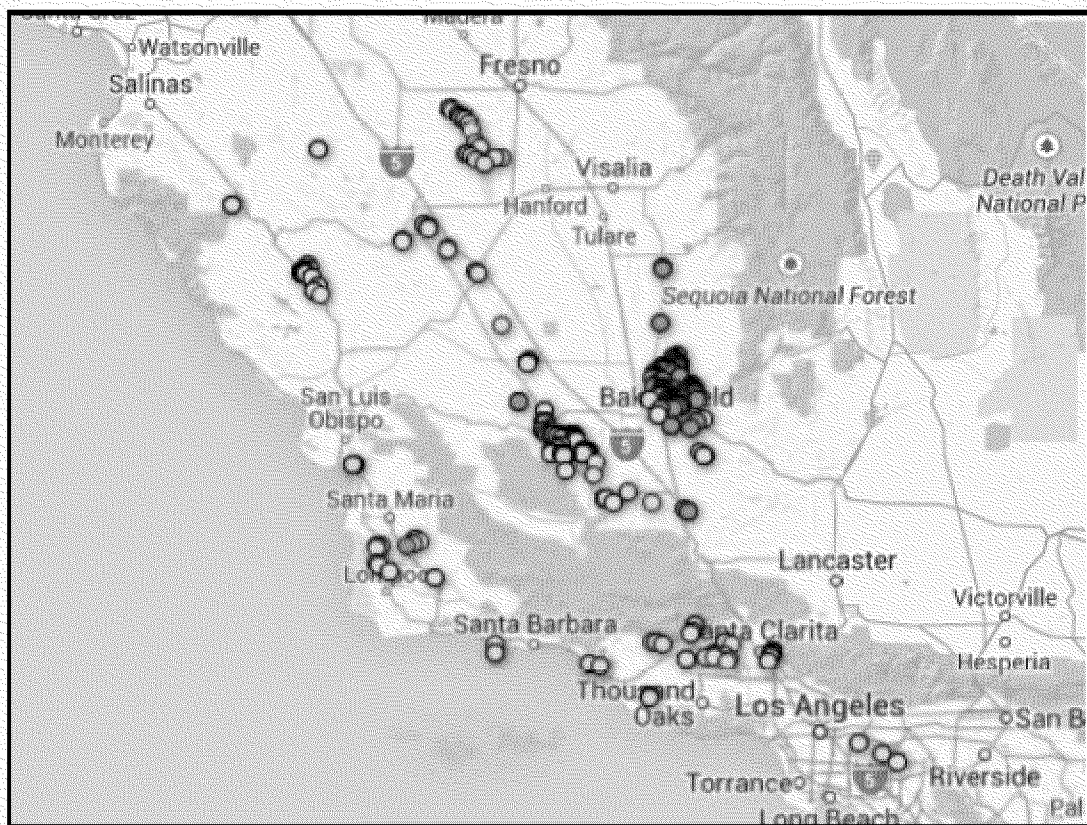
2012: EPA conducted a preliminary review of AEs in California, which indicated injection into fresh formations and beyond AE boundaries.

Well Investigation by State



June 2014: DOGGR, working with the State Water Resources Control Board (**Water Board**), identified instances where

- injection had been permitted into non-exempt aquifers containing high quality water
- Injection wells were located in the vicinity of water supply wells.



Wells under Investigation

as of August 2014

- 0-3000 ppm
- 3000-10000 ppm
- unknown

Well Closure & Evaluation



July 2014: DOGGR ordered operations ceased at 11 wells due to injection in non-exempt high quality aquifers.

Thursday, Jul 31, 2014 04:14 PM

State shuts another Kern oil injection well

BY JOHN COX California staff writer jcox@bakersfield.com



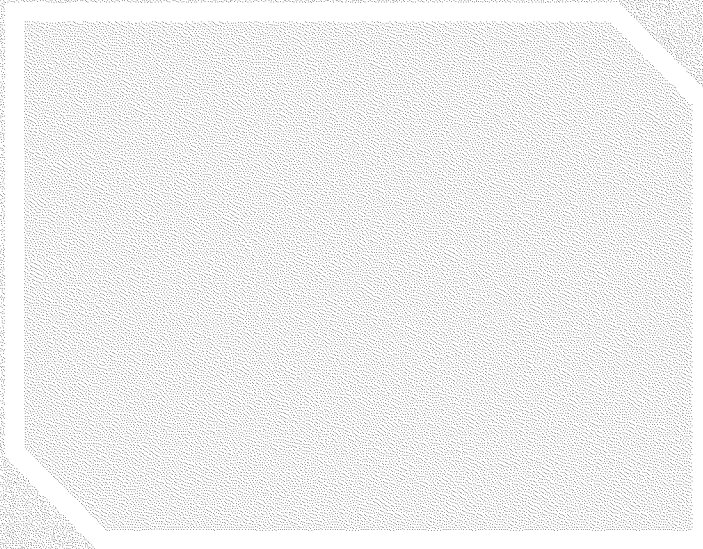
July 2014: EPA requested that DOGGR and the Water Board (the **State**) provide

- ✓ drinking water source evaluation from improper Class II injection
- ✓ documentation on AEs.

September 2014: The State responded to EPA, describing their identification and assessment efforts to date.



December 2014: EPA issued a follow up request for a UIC Program Revision Plan by February 2015 to ensure program compliance by February 15, 2017, addressing



- ✓ Class II wells that may be injecting into non-exempt aquifers
- ✓ process for consideration/submittal of new and expanded AEs
- ✓ review of exempt aquifers using new data.

State UIC Revision Plan



CA Reviewing Oil Wells as EPA Cracks Down on “Mismanaged” Program

© AP Photo/ Rich Pedroncelli

Environment

04:52 10.02.2015(updated 10:51 10.02.2015)

The US Environmental Protection Agency is going to review California's underground injection control program amid concerns about the impact of oil and gas companies on the quality of drinking water in the region, the EPA told Sputnik.

The New York Times

<http://nyti.ms/1zre1Vv>

U.S. | NATIONAL BRIEFING | WEST

California: Water Safety Plan Sent to E.P.A.

By THE ASSOCIATED PRESS FEB. 9, 2015

February 2015: The State submitted the requested Class II UIC Program Revision Plan.

February and March 2015: State-sponsored workshops concerning AE proposal requirements were held in Bakersfield and Long Beach for oil and gas operators.



California Class II UIC Program Corrective Action Plan Schedule

A. Drinking Water Protection Well Evaluations

- Complete evaluations for "Category 1" injection wells (March 15, 2015)
- Complete evaluations for "Category 2" injection wells (June 15, 2015)
- Revise Enclosure B of the State's February 6th letter to include a schedule for completing a review of these wells and submit, if applicable, to meet the February 15, 2017 compliance deadline
- Complete evaluations for "Category 3" injection wells (February 15, 2017)

B. Well Shut-Ins

- Shut-in deadline for wells injecting into non-exempt, non-protected aquifers with TDS below 3,000 mg/l TDS (October 15, 2015)
- Shut-in deadline for wells injecting into the 11 aquifers historically exempted by EPA pursuant to this corrective action plan (February 15, 2017)
- Shut-in deadline for all existing wells injecting into non-exempt, non-protected aquifers with TDS below 3,000 mg/L TDS (February 15, 2017)

C. Aquifer Exemption Process

- Issue Aquifer Exemption Guidance (April 1, 2015)
- Deadline for submission to EPA of all proposed aquifer exemptions for Category 1 wells injecting into aquifers containing 3,000 mg/L TDS or less (excluding wells injecting into the 11 aquifers historically exempted by EPA pursuant to this corrective action plan) (February 15, 2017)

March 2015: EPA responded to the State's plan, specifying a schedule of required activities and deliverables with target milestones and deadlines, in order to track progress towards meeting the February 2017 compliance deadline.

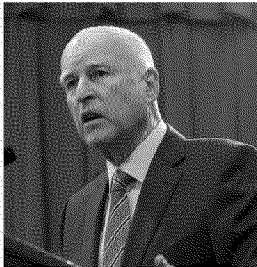


March 2015: The CA State Legislature held a joint oversight hearing of the Senate Natural Resources & Water and Environmental Quality Committees titled “Ensuring Groundwater Protection: Is the UIC Program Working?”

BUSINESS

Lawmakers demand oil firms stop pumping waste into aquifers

By David R. Baker | March 20, 2015 | Updated: March 20, 2015 7:32pm



6 CA state senators wrote to Gov. Brown requesting steps be taken to stop illegal injection into non-exempt aquifers.

4 members of the US House of Representatives wrote to DOGGR requesting that all wells under investigation be shut down immediately.



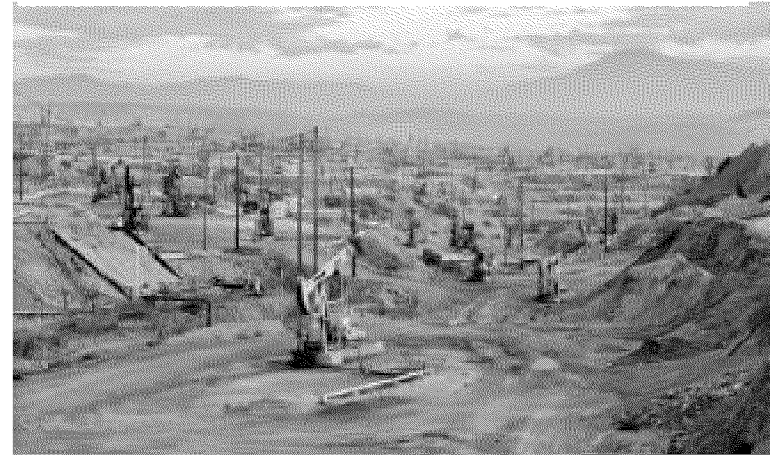
March 2015: The Kern County Board of Supervisors wrote to Administrator McCarthy requesting that EPA not order the further closure of any injection wells.

April 2015: While the State continues to implement their Revision Plan, EPA will continue its oversight to make sure that the State program meets federal requirements & that USDWs are protected.

U.S.

In California, Farmers Rely on Oil Wastewater to Weather Drought

By ZOE SCHLANGER / APRIL 6, 2015 6:34 AM EDT



*ANY
QUESTIONS?*